Listing of the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-8. (canceled)

9. (currently amended) A multi-block copolymer comprising in polymerized form ethylene and one or more copolymerizable comonomers, said copolymer containing therein two or more ~~segmented~~ blocks differing in comonomer content, crystallinity, density, melting point or glass transition temperature; the multi-block copolymer having a polydisperse block number distribution and a polydisperse distribution of block sizes.

10. (previously presented) The multi-block copolymer of claim 9 having at least one melting point, T_m, in degrees Celsius and density, d*, in grams/cubic centimeter, wherein the numerical values of the variables correspond to the relationship:

$T_m > -2002.9+4538.5(d^*)-2422.2(d^*)^2$, and wherein the copolymer has a M_w/M_n from 1.7 to 3.5.

11. (previously presented) The multi-block copolymer of claim 9 having a Mw/Mn from 1.7 to 3.5, a delta quantity (tallest DSC peak minus tallest CRYSTAF peak) greater than the quantity, y*, defined by the equation:

$$y^* > -0.1299(\Delta H)+62.81,$$

and a heat of fusion up to 130 J/g,

wherein the CRYSTAF peak is determined using at least 5 percent of the cumulative polymer, and if less than 5 percent of the polymer has an identifiable CRYSTAF peak, then the CRYSTAF temperature is 30°C, and ΔH is the numerical value of the heat of fusion in J/g.

12. (previously presented) The multi-block copolymer of claim 9 having a tensile strength above 10 MPa and an elongation at break of at least 600 percent at a crosshead

separation rate of 11 cm/minute.

13. (previously presented) The multi-block copolymer of claim 9 having a delta quantity (tallest DSC peak (measured from the baseline) minus tallest CRYSTAF peak) greater than 48°C and a heat of fusion greater than or equal to 130 J/g, wherein the CRYSTAF peak is determined using at least 5 percent of the cumulative polymer, and if less than 5 percent of the polymer has an identifiable CRYSTAF peak, then the CRYSTAF temperature is 30°C.

14. (previously presented) The multi-block copolymer of claim 9 having a storage modulus ratio, G'(25°C)/G'(100°C) of from 1 to 50 and a 70°C compression set of less than 80 percent.

15. (previously presented) The multi-block copolymer of claim 9 having a heat of fusion of less than 85 J/g and a pellet blocking strength of equal to or less than 100 lbs/ft^2 (4800 Pa).

16. (previously presented) The multi-block copolymer of claim 9 comprising in polymerized form at least 50 mole percent ethylene, having a 70°C compression set of less than 80 percent.

17. (previously presented) The multi-block copolymer of claim 9, containing a single crystalline melting point (Tm) as measured by DSC.

18. (previously presented) The multi-block copolymer of claim 9, having a thermomechanical analysis penetration depth of 1 mm at a temperature of at least 90°C, and a flexural modulus of from 3 kpsi (20 MPa) to 13 kpsi (90 MPa).

19. (canceled)

20. (previously presented) The multi-block copolymer of claim 9, having an

abrasion resistance volume loss according to ISO 4649 of less than 90 mm^3.

21. (previously presented) The multi-block copolymer of claim 18 having an abrasion resistance volume loss according to ISO 4649 of less than 90 mm^3.

22. (previously presented) The multi-block copolymer of claim 9, having an abrasion resistance volume loss according to ISO 4649 of less than 90 mm^3 and having a storage modulus, G', such that log (G') is greater than or equal to 0.4 MPa, at a temperature of 100°C.

23. (previously presented) The multi-block copolymer of claim 18 having an abrasion resistance volume loss according to ISO 4649 of less than 90 mm^3 and having a storage modulus, G', such that log (G') is greater than or equal to 0.4 MPa at a temperature of 100°C.

24. (previously presented) The multi-block copolymer according to claim 20 having a storage modulus, G', such that log (G') is greater than or equal to 1.0 MPa, at a temperature of 100°C.

25. (previously presented) The multi-block copolymer according to claim 21 having a storage modulus, G', such that log (G') is greater than or equal to 1.0 MPa, at a temperature of 100°C.

26. (currently amended) A crosslinked derivative of a multi-block copolymer according to claim 9 ~~any one of claims 9-25, or preparable by the method of claim 8~~.

27. (previously presented) The multi-block copolymer according to claim 9 in the form of a film, at least one layer of a multilayer film, at least one layer of a laminated article, a foamed article, a fiber, a nonwoven fabric, an injection molded article, a blow molded article, a roto-molded article, or an adhesive.

28. (previously presented) The multi-block copolymer of claim 9 comprising a M_w/M_n fitting a Schultz-Flory distribution.

29. (previously presented) The multi-block copolymer of claim 9 comprising a block with at least 90 mol percent units of polymerized ethylene.

30. (previously presented) The multi-block copolymer of claim 9 wherein the average number of blocks per average chain is greater than 3.0.

31. (previously presented) The multi-block copolymer of claim 9 wherein the chain ends of the individual multi-block copolymer chains are crystalline.

32. (previously presented) The multi-block copolymer of claim 9 having a microcrystalline order selected from the group consisting of spherulites and lamellae.

33. (currently amended) The multi-block copolymer of claim 32 having a M_w/M_n of 1.3 to 5.0 ~~or greater~~.

34-36. (canceled)